REMARKS

Claims 15-28 have been cancelled. Upon entry of this amendment, claims 1, 2 and 5-11 will be pending in the application. Attached hereto is a marked-up version of the changes made to the claims by this amendment. The attached pages are captioned "Version With Markings to Show Changes Made."

Response to Restriction Requirement

Applicants affirm the provisional election to prosecute the claims of Group I (1, 2 and 5-11) in this application. Claims 15-28 have been cancelled as being drawn to a non-elected invention.

Rejections under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 1, 2, 5 and 7-11 under 35 U.S.C. §103(a). The invention defined in the pending claims is submitted as patentable over the disclosure in U.S. Patent No. 5,322,899 (Grunewalder et al.) in view of (a) JP 54034359 (JP '359) or U.S. Patent No. 4,129,535 (Elcik) and (b) U.S. Patent No. 4,965,309 (Batdorf) or Elcik.

The polymer composition of the present invention is suitable for use as a capstock composition for application as a protective surface layer on an underlying substrate made of a plastics material, such as PVC-u (i.e., unplasticized polyvinyl chloride), so as to impart not only resistance to weather and to the effects of the ultraviolet components of sunlight, but also fire resistance. Thus, the problem faced by the inventors was to devise a polymer composition which can be used as a capstock composition for coating, for example, polyvinyl chloride building

materials and products, such as window frames, roofline and cladding products, rainwater systems and piping systems. Furthermore, the inventors faced the additional problem of making a polymer composition which not only has good weatherability and resistance to ultraviolet light, as well as fire retardant properties, but which also can be extruded at moderate temperatures. This last mentioned property is necessary if the polymer composition is to be co-extrudable with a polymer of relatively low melting point and relatively low heat stability, such as PVC-u, so as to yield a laminated product in which the thin surface layer of the capstock polymer composition adheres well to the underlying polyvinyl chloride mass, does not peel off even after prolonged exposure to the weather and to the effects of direct sunlight at high summer temperatures and provides excellent fire protection to the underlying heat sensitive polyvinyl chloride mass.

In order for a polymer composition to be co-extrudable with PVC-u, it needs to have a melting point below about 200°C, since this is the temperature above which PVC-u becomes unstable in an extrusion production process.[1] However, high molecular weight acrylic polymers that might otherwise be suitable as capstock polymer compositions typically require extrusion temperatures in the range of from about 210°C to about 240°C.

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[1] Polyvinyl chloride building materials and products, such as window frames, roofline and cladding products, rainwater systems, and piping systems are typically co-extruded from PVC-u and a conventional capstock at temperatures in the range of from about 150°C to about 200°C. Foamboard products, such as cladding and roofline products, are typically co-extruded in the range of from about 150°C to about 185°C. Rigid products, such as window frames, are typically co-extruded at temperatures within the range of from about 170°C to about 195°C.

The inventors of the present invention have solved these problems by devising the polymer composition set forth in claim 1 comprising (a) a melt extrudable acrylic polymer component comprising more than 50% by weight, based on the weight of the acrylic polymer component, of a high molecular weight acrylic polymer having a molecular weight of from about 150,000 to about 350,000 and up to 50% by weight, based on the weight of the acrylic polymer component, of a low molecular weight acrylic polymer having a molecular weight of from about 10,000 to about 100,000; (b) from 10% to 50% by weight of a halogen donor component, such as polyvinyl chloride; (c) an effective amount of a halogen volatilisation agent; and (d) a char-inducing component. By using a polymer composition containing these components, the inventors have been able to make, by a co-extrusion process, laminated products with excellent fire resistance and weatherability in which the thin surface layer applied as capstock adheres well to the underlying polyvinyl chloride product, has an attractive appearance, exhibits good weatherability, and passes the very stringent requirements for achieving Class 1Y according to BS476: Part 7: 1987 Method for Classification of the Surface Spread of Flame of Products.

In order to establish a *prima facie* case of obviousness, the Patent Office must establish, among other things, that the prior art teaches or suggests all of the claim limitations. Applicants respectfully submit that the references relied on by the Examiner fail to establish a *prima facie* case of obviousness.

Grunewalder et al., in the primary reference, disclose a capstock polymer composition said to be suitable for co-extrusion onto various thermoplastic substrates, including polyvinyl chloride. The capstock composition comprises a fluoropolymer

blended with a combination of two acrylic polymers, the first acrylic polymer having a major (i.e., more than 50%) methyl methacrylate monomeric component and the second acrylic polymer having a major (i.e., more than 50%) ethyl methacrylate monomeric component (See col. 3, line 53 to col. 4, line 3). The ratio of the first acrylic polymer to the second acrylic polymer present in the blend is preferably about 1:1 (See col. 4, lines 19-20). The capstock polymer composition of Grunewalder may also include various pigments, fillers, lubricants and other additives.

While Applicants acknowledge that Grunewalder et al. disclose a capstock polymer composition including a halogen donor component and an acrylic polymer component comprising two acrylic polymers, it is respectfully submitted that the primary reference fails to teach or suggest the melt extrudable acrylic polymer component recited in claim 1 and comprising more than 50% by weight, based on the weight of the acrylic polymer component, of a high molecular weight acrylic polymer having a molecular weight of from about 150,000 to about 350,000 and up to 50% by weight, based on the weight of the acrylic polymer component, of a low molecular weight acrylic polymer having a molecular weight of from about 10,000 to about 100,000. Instead, all that Grunewalder et al. teach is that the acrylic polymer component include a first acrylic polymer which is the polymerization product of monomers whose major constituent is methyl methacrylate and a second acrylic polymer which is the polymerization product of monomers whose major constituent is ethyl methacrylate. Grunewalder et al. are silent as to the molecular weights of the two acrylic polymers. Moreover, since there is no description of the specific acrylic polymer compositions (i.e., the other monomers or polymers present with

the methyl methacrylate and ethyl methacrylate monomers in amounts less than 50% by weight of the resin solids - See the paragraph of Grunewalder et al. bridging columns 3 and 4), one of ordinary skill in the art would not be able to discern or even approximate the likely molecular weights of the two acrylic polymers.[2]

Accordingly, Grunewalder et al. fail to show any appreciation that an acrylic polymer component used in a capstock polymer composition could or should comprise two acrylic polymers that differ in molecular weight as required in claim 1. More particularly, there is no disclosure or suggestion in Grunewalder et al. that one of the acrylic polymers be a high molecular weight polymer and the other be a low molecular weight polymer, much less that the high molecular weight acrylic polymer should be present in an amount of more than 50% by weight of the acrylic polymer component and the low molecular weight acrylic polymer should be present in an amount of less than 50% by weight of the acrylic polymer component. Still further, there is no disclosure or teaching in Grunewalder of the ranges of molecular weights for the high molecular weight and low molecular weight acrylic polymers recited in claim 1. In addition to failing to disclose the melt extrudable acrylic polymer component defined in claim 1, Grunewalder et al. contains no disclosure which would suggest to one of ordinary skill in the art to select a melt extrudable polymer component having the specific requirements of set forth in claim 1 or cause one of ordinary skill in the art to

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[2] Applicants are unaware of the molecular weights of the PLEXIGLAS® VS100 poly(methyl methacrylate) acrylic polymer and ACRYLOID ® B72 ethyl methacrylate/methyl acrylate acrylic copolymer used in Example 1 of Grunewalder et al.

anticipate that the selection of a melt extrudable polymer component having the specific requirements of claim 1 would produce a capstock composition exhibiting the improved characteristics detailed above.

The shortcomings of the primary reference cannot be overcome by resort to JP '359, Elcik and/or Batdorf. None of these secondary references teach or suggest the melt extrudable acrylic polymer component as defined in claim 1. Accordingly, even if one were to combine the teachings of these references with that of Grunewalder et al., one of ordinary skill in the art would not arrive at the invention defined in claim 1. In the absence of any teaching or suggestion of these affirmative limitations of claim 1, Applicants respectfully submit that the references upon which the Examiner relies fail to establish a *prima facie* case of obviousness with respect to claim 1. Accordingly, claim 1 and dependent claims 2, 5 and 7-11 are submitted as patentable over Grunewalder et al. in view of (a) JP '359 or Elcik and (b) Batdorf or Elcik.

Reconsideration is respectfully requested of the rejection of claim 6 under 35 U.S.C. §103(a) as unpatentable over Grunewalder et al. in view of JP `359 or Elcik and (b) Batdorf or Elcik, in further view of U.S. Patent No. 4,032,498 (Dany et al.) or U.S. Patent No. 5,200,446 (Bergner).

Claim 6 depends from claim 1 and is directed to a polymer composition in accordance with claim 1 wherein the halogen donor component comprises a halogen-containing polymer which has a K value of from about 50 to about 65. The shortcomings in the *prima facie* case of obviousness noted above with respect to claim 1 are not overcome by the disclosure in Dany et al or Bergner.

Accordingly, claim 6 is likewise submitted as patentable over the references cited in the Office action.

Conclusion

In view of the above, it is respectfully submitted that the pending claims are clearly patentable over the art of record.

Favorable reconsideration and allowance of all pending claims are respectfully solicited.

Applicants request an extension of time to and including December 13, 2002 for filing a response to the above-mentioned Office action. A check in payment of the applicable extension fee is enclosed.

The Commissioner is requested to charge any fee deficiency or overpayment in connection with this amendment to Deposit Account 19-1345.

Respectfully submitted,

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*Attachment

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VERSION WITH MARKINGS SHOWING CHANGES MADE

IN THE CLAIMS:

Claims 15-28 have been canceled.